# PATENT ABSTRACTS OF JAPAN

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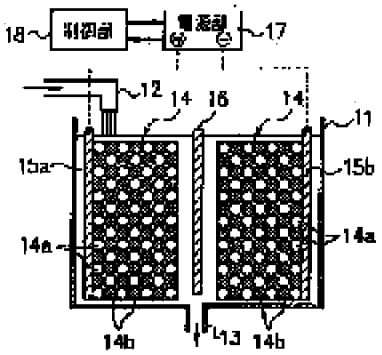
## (54) MINERAL WATER GENERATING UNIT

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a mineral water generating unit capable of enhancing mineral elution efficiency of mineral eluates, fastening and maintenance ability of mixtures and further preventing the lowering of the solubility of minerals and eliminating mineral deposits.

SOLUTION: In an electrolytic tank 11 into which raw water such as running water is fed, a mineral eluate 14a which elutes mineral components is arranged and a pair of anode and cathode 15a, 15b for mineral elution by the application of direct-current voltage are disposed to constitute a mineral water generation unit. Between the pair of anode and cathode 15a, 15b for mineral elution, the mineral eluate 14a and a conductive material 14b are arranged. Thereby, electrolytic efficiency is enhanced by the conductive material 14b, and mineral components are eluted in a short time. Further, the arrangement of an acidic food additive causes the pH within the electrolytic tank 11 to be adjusted; thus, lowering of efficiency in mineral elution can be prevented.



## CLAIMS

[Claim(s)]
[Claim 1]While arranging a mineral effluent eluted in a mineral ingredient in a cell with which raw water, such as tap water, is supplied, A mineral water generating device having arranged said mineral effluent and a conductive substance in a mineral water generating device which has arranged an electrode for mineral elution of a yin-and-yang couple to which direct current voltage is impressed to the inter-electrode one of said yin-and-yang couple for mineral elution.
[Claim 2]While arranging a mineral effluent eluted in a mineral ingredient in a cell with which raw water, such as tap water, is supplied, A mineral water generating device having arranged said mineral effluent, a conductive substance, and an acid-foods additive in a mineral water generating device which has arranged an electrode for mineral elution of a yin-and-yang couple to which direct current voltage is impressed to the inter-electrode one of said yin-and-yang couple for mineral elution.
[Claim 3]While arranging a mineral effluent eluted in a mineral ingredient in a cell with which raw water, such as tap water, is supplied, In a mineral water generating device which has arranged an electrode for mineral elution of a yin-and-yang couple to which direct current voltage is impressed, while arranging said mineral effluent and a conductive substance to the inter-electrode one of said yin-and-yang couple for mineral elution, A mineral water generating device installing a hydrogen ion exponent equalizing tank in which an acid-foods additive has been arranged in an excurrent canal way of mineral water generated with said cell.
[Claim 4]A mineral water generating device, wherein said mineral effluent concerning claim 1 and claim 3, said conductive substance and said mineral effluent concerning claim 2 and said conductive substance, and said acid-foods additive are mixtures which mix these, respectively.
[Claim 5]It has an available chlorine generating electrode in which voltage of reverse polarity is impressed to one electrode of said each electrode for mineral elution, A mineral water generating device of claim 1 thru/or claim 4 given in any 1 paragraph having a mineral and the available chlorine generation unit which carries out the placed opposite of this available chlorine generating electrode to this one electrode into said cell.
[Claim 6]The mineral water generating device according to claim 5 having two or more said minerals and available chlorine generation units.
[Claim 7]While setting an interval and carrying out the placed opposite of said two electrodes for mineral elution of the anode, A mineral water generating device of claim 4 thru/or claim 6 given in any

1 paragraph having a mineral generation unit which arranges said mixture separately inside an electrode for mineral elution of each of this anode, respectively, and arranges said electrode for mineral elution of the negative pole common between this each mixture.

[Claim 8]The mineral water generating device according to claim 7 carrying out two or more owners of said mineral generation unit.

[Claim 9]A mineral water generating device of claim 1 thru/or claim 8 given in any 1 paragraph characterized by having arranged an available chlorine generating electrode in which direct current voltage of the negative pole is impressed to the outside of at least one electrode for mineral elution among electrodes for mineral elution of each of said anode.

[Claim 10]A mineral water generating device of claim 4 thru/or claim 9 given in any 1 paragraph said mixture's having contacted said electrode for mineral elution of the anode, or having arranged it near this electrode for mineral elution of the anode.

[Claim 11]A mineral water generating device of claim 1 thru/or claim 10 given in any 1 paragraph having arranged barrier membrane which consists of a nonwoven fabric, an ion-exchange membrane, etc. between said each electrode for mineral elution.

[Claim 12]A mineral water generating device of claim 1 thru/or claim 11 given in any 1 paragraph installing a sludge removal tub which is generated by said cell and removes a mineral sludge on an excurrent canal way of mineral water.

[Claim 13]A mineral water generating device of claim 4 thru/or claim 12 given in any 1 paragraph having arranged the upper part of said mixture so that it may not counter with said electrode for mineral elution.

[Claim 14]A mineral water generating device of claim 1 thru/or claim 13 given in any 1 paragraph, wherein said conductive substance is any one or these mixtures of powdered activated carbon, granular active carbon, fibrous activated carbon, charcoal, carbon black, gold, silver, and platinum system metal.

[Claim 15]The mineral water generating device according to claim 14 with which silver adheres and said each activated carbon is characterized by things.

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[Translation done.]

## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the mineral water generating device which adds a mineral ingredient to raw water and generates mineral water.
[0002]
[Description of the Prior Art]Conventionally, what stored the filter medium from which a mineral stone and impurity are removed is generally used in the tank as this kind of a mineral generating device. When raw water, such as tap water, passes in this tank, a mineral ingredient is added to tap water and the drinking water of mineral content is supplied.
[0003]However, the mineral ingredients added to a drink are actually few (50 ppm or less the addition amount of a mineral ingredient : as total hardness), and it cannot be satisfied with this mineral water generating device as mineral drinking water.
[0004]In order to solve such a problem, the mineral water generating device indicated to JP,6-190379,A was proposed. Carbon dioxide was poured into tap water, free-carbon-dioxide concentration was raised, this tap water was contacted to the porous body which supported calcium carbonate, the mineral ingredient was eluted for a short time, and the supply of the mineral drinking water of request concentration of this mineral water generating device was attained.
[0005]However, in this mineral water generating device, the cylinder for carbon dioxide pouring was needed, and it had the problem that a device was enlarged, not to mention cost.
[0006]In order to solve such a problem, the mineral water generating device otherwise indicated to JP,9-164390,A was proposed.
[0007]This mineral water generating device stores a mineral effluent while arranging the electrode for mineral elution of a yin-and-yang couple in a cell. According to this mineral water generating device, by impressing direct current voltage to the inter-electrode one for mineral elution, Water is electrolyzed, acid water is generated by the electrode side for mineral elution of the anode, this acid water carries out lytic reaction to a mineral effluent (for example, calcium carbonate), and he is trying to make a mineral ingredient eluted.
[0008]
[Problem(s) to be Solved by the Invention]However, in the latter mineral water generating device, in

order to arrange the mineral effluent which is an insulating material between the electrodes for mineral elution of a yin-and-yang couple, this mineral effluent became a cause, electrolysis was checked, and it had the problem that mineral elution efficiency fell.
[0009]The interval of each electrode for mineral elution was narrowly set up so that electrolysis capability might not decline, but when this interval became narrow, the disposition space of the mineral effluent also became narrow, and it had the problem that attachment nature and maintenance nature fell.
[0010]When the lower stream was sterilized from the sterilization in a cell, or a cell, the chlorine generator needed to be installed in the proper place and it had the problem that the composition of the whole water purification circuit became complicated.
[0011]Although mineral elution efficiency is influenced by the insulating situation as mentioned above, big influence is simultaneously received in the hydrogen ion exponent (pH) in a cell with this.
[0012]That is, although calcium carbonate begins to melt from a mineral effluent (for example, Coral Sea sand) by electrolysis and it dissolves in water, when pH in a cell becomes high, and pH becomes 9.5 or more according to the experiment as calcium carbonate dissolves, the solubility of calcium carbonate falls rapidly. Therefore, it had the problem that mineral concentration fell conversely with the increase in the amount of electrolysis (electrolysis time or electrolytic current value).
[0013]such [ on the other hand ] minerals -- the fall of solubility invited the deposit of a mineral ingredient and had the problem that a sludge was got blocked with the excurrent canal way of the downstream of a cell, and caused a piping blockade.
[0014]The purpose of this invention raises the mineral elution efficiency of a mineral effluent in view of said conventional SUBJECT, It is in providing the mineral water generating device which can raise the attachment nature and maintenance nature of a mixture, can make available chlorine concentration high, and also prevents the fall of mineral solubility and also from which a mineral sludge can be removed.
[0015]
[Means for Solving the Problem]In order that this invention may solve said SUBJECT, an invention of claim 1, While arranging a mineral effluent eluted in a mineral ingredient in a cell with which raw water, such as tap water, is supplied, In a mineral water generating device which has arranged an electrode for mineral elution of a yin-and-yang couple to which direct current voltage is impressed, it has structure which has arranged a mineral effluent and a conductive substance to the inter-electrode one of a yin-and-yang couple for mineral elution.
[0016]According to the invention of claim 1, when impressing direct current voltage to each electrode for mineral elution, in the electrode side for mineral elution of the anode, a hydrogen-ion density becomes high, acid water is generated, and, on the other hand, alkaline water is generated by the electrode side for mineral elution of the negative pole. Here, since an elution operation of a mineral ingredient takes place by a reaction with a hydrogen ion, it depends for it on a hydrogen-ion density and by extension, electrolytic performance. In an invention of claim 1, since a mineral effluent and a conductive substance are arranged to each inter-electrode one, electrolytic efficiency improves with this conductive substance, and it is eluted in a mineral ingredient for a short time.
[0017]While an invention of claim 2 arranges a mineral effluent eluted in a mineral ingredient in a cell

with which raw water, such as tap water, is supplied, In a mineral water generating device which has arranged an electrode for mineral elution of a yin-and-yang couple to which direct current voltage is impressed, it has structure which has arranged a mineral effluent, a conductive substance, and an acid-foods additive to the inter-electrode one of a yin-and-yang couple for mineral elution.

[0018]According to the invention of claim 2, although a mineral effluent dissolves by electrolysis, a rise of pH in a cell is controlled with an acid-foods additive. Thereby, a fall of mineral solubility is prevented. Since acid used as a neutralizer is a food additive, it is harmless to a human body.

[0019]While an invention of claim 3 arranges a mineral effluent eluted in a mineral ingredient in a cell with which raw water, such as tap water, is supplied, In a mineral water generating device which has arranged an electrode for mineral elution of a yin-and-yang couple to which direct current voltage is impressed, while arranging a mineral effluent and a conductive substance to the inter-electrode one of a yin-and-yang couple for mineral elution, It has structure which installed a hydrogen ion exponent equalizing tank in which an acid-foods additive has been arranged in an excurrent canal way of mineral water generated with a cell.

[0020]According to the invention of claim 3, since mineral water which flows into an excurrent canal way is neutralized by acid-foods additive, a deposit of a mineral ingredient in an excurrent canal way is controlled, and pipe clogging is prevented. Since it is not what arranges an acid-foods additive in a cell like an invention of claim 2, it can be filled up with a mineral effluent so much in a cell, and a turnover rate of a mineral effluent can be lessened.

[0021]A mineral effluent, a conductive substance, and an acid-foods additive which mix a mineral effluent and a conductive substance concerning claim 1 and claim 3, and are applied to claim 2 are mixed, and it may be made to form like an invention of claim 4.

[0022]In a mineral water generating device of claim 1 thru/or claim 4 an invention of claim 5, It has an available chlorine generating electrode in which voltage of reverse polarity is impressed to one electrode of each electrode for mineral elution, and has structure of having a mineral and the available chlorine generation unit which carries out the placed opposite of the available chlorine electrode to one electrode into a cell.

[0023]According to the invention of claim 5, when impressing direct current voltage to an electrode for mineral elution, and an available chlorine generating electrode, and it is generated by chlorine in an electrode of the anode and this melts into water, it is generated by hypochlorous acid which is available chlorine, and water which has sterilizing performance is generated. When providing two or more minerals and available chlorine generation units like claim 6, in a mass mineral water generating device, it becomes effective especially.

[0024]While an invention of claim 7 sets an interval and carries out the placed opposite of the two electrodes for mineral elution of the anode in a mineral water generating device of claim 4 thru/or claim 6, Inside an electrode for mineral elution of each anode, a mixture is arranged separately, respectively, and it has structure of having a mineral generation unit which arranges an electrode for mineral elution of the common negative pole, between each mixture.

[0025]According to the invention of claim 7, since the electrode for mineral elution of the negative pole is common when a mineral ingredient is eluted from two mixtures, structure becomes easy. When providing two or more mineral generation units like claim 8, in a mass mineral water generating

device, it becomes effective especially.
[0026]An invention of claim 9 has structure which has arranged an available chlorine generating electrode in which direct current voltage of the negative pole is impressed to the outside of at least one electrode for mineral elution among electrodes for mineral elution of each anode in a mineral water generating device of claim 1 thru/or claim 8.
[0027]According to the invention of claim 9, it is generated with an available chlorine generating electrode by hypochlorous acid which is available chlorine, and mineral water which has sterilizing performance is generated. When contacting an electrode for mineral elution of the anode or arranging a mixture near the electrode for mineral elution of the anode like a mineral water generating device of claim 10, it is efficiently eluted in a mineral ingredient by the anode side. Like an invention of claim 11, by arranging barrier membrane which consists of a nonwoven fabric, an ion-exchange membrane, etc. between each electrode for mineral elution, mixing with acid water and alkaline water is prevented, and decline in mineral elution efficiency can be prevented.
[0028]An invention of claim 12 has structure which installed a sludge removal tub which is generated by cell and removes a mineral sludge on an excurrent canal way of mineral water in a mineral water generating device of claim 1 thru/or claim 11.
[0029]According to the invention of claim 12, while plugging in an excurrent canal way is prevented since this is removed by a sludge removal tub when a mineral sludge is generated, a sludge does not mix in a mineral drink.
[0030]An invention of claim 13 has structure arranged so that the upper part of a mineral effluent may not counter with an electrode for mineral elution in a mineral water generating device of claim 1 thru/or claim 12.
[0031]According to the invention of claim 13, when energizing to an electrode for mineral elution, a mineral ingredient is eluted from a portion which has countered an electrode among mineral effluents. And this mineral elution operation covers a long time, and continues, and mineral effluents of this facing site decrease in number gradually. On the other hand, it is supplied from a part in which mineral effluents of a facing site decreased in number, and a portion which has not countered an electrode for mineral elution.
[0032]A conductive substance Powdered activated carbon, granular active carbon, fibrous activated carbon, charcoal, Silver may be made to adhere in order to raise conductivity, when it may be any one or these mixtures of carbon black, gold, silver, and platinum system metal and conductive material is activated carbon (claim 14) (claim 15).
[0033]
[Embodiment of the Invention]Drawing 1 shows a 1st embodiment of the mineral water generating device concerning this invention. This mineral water generating device has the cell 11 of a top opening, the service pipe 12 connected with the water pipe is arranged at the top opening of the cell 11, and tap water is stored in the cell 11. The intake pipe 13 has connected with the bottom wall of the cell 11, and it overflows on the faucet (not shown) of an end through this intake pipe 13.
[0034]In this cell 11, the mixture 14 is arranged at two right and left, and it contacts or approaches and the electrodes 15a and 15b for mineral elution of the yin-and-yang couple are arranged at the outside of this mixture 14. The barrier membrane 16 formed by the nonwoven fabric or the ion-

exchange membrane between each mixture 14 has been arranged, and by this barrier membrane 16, although it is not perfect, the cell 11 is divided into right and left.

[0035]The mixture 14 comprises the mineral effluent 14a and the conductive substance 14b. As this mineral effluent 14a, what made the Coral Sea sand, a boiled-mixture-of-rice-and-barley stone, a mineral stone, etc. powdered or granular is used. On the other hand, as for the conductive substance 14b, any one or these mixtures of powdered activated carbon, granular active carbon, fibrous activated carbon, charcoal, carbon black, gold, silver, and platinum system metal are used. Since these conductive material 14b serves as a carbon system, gold, silver, and platinum system metal, even when this is eluted, it is harmless to a human body. Silver may be made to adhere in order to raise conductivity, when a conductive substance is activated carbon. Although the mixture 14 is mixing the above mineral effluents 14a and the conductive substances 14b, water passes along it in the inside. In order to raise attachment nature and maintenance nature, the case (not shown) where it has water permeability beforehand is filled up with the mixture 14, and it may be made to arrange to the cell 11. In this case, it is sufficient if a case is filled up with a mineral effluent and a conductive substance with granular or the shape of complications.

[0036]As for the electrodes 15a and 15b for mineral elution, direct current voltage is impressed from the power supply section 17 of the direct current, one electrode 15a for mineral elution is the anode, and the electrode 15b for mineral elution of another side is the negative pole. In this power supply section 17, a pressure value, polarity, resistance welding time, etc. are controlled by the control section 18.

[0037]When impressing direct current voltage to the electrodes 15a and 15b for mineral elution of the mineral water generating device concerning this embodiment, in the electrode 15a side for mineral elution of the anode, it becomes $2H_2O \rightarrow 4H^+ + O_2 + 4e^-$, a hydrogen-ion density rises, and acid water is generated. On the other hand, in the electrode 15b side for mineral elution of the negative pole, it becomes $4H_2O + 4e^- \rightarrow 2H_2 + 4OH^-$, and the alkaline water is generated. Here, the mineral effluent 14a (for example,; calcium carbonate : $CaCO_3$) reacts to acid water, it becomes $CaCO_3 + 2H^+ \rightarrow Ca^{2+} + H_2O + CO_2$, and mineral ions ($Ca^{2+}$) are eluted.

[0038]Although the mineral effluent 14a acts here as a factor which it is an insulating material and reduces the conductivity between each electrode 15a for mineral elution, and 15b, Since the mineral water generating device concerning this embodiment is mixing the conductive substance 14b into the mixture 14, electrolytic efficiency does not become low and mineral elution efficiency does not fall by extension, either.

[0039]Since the large interval between each electrode 15a for mineral elution and 15b can also be taken by improvement in electrolytic efficiency, the disposition space of the part and the mixture 14 becomes large, and the mineral effluent 14a can be stored so much. The clearing work of the mixture 14 also becomes easy and its attachment nature and maintenance nature of the mixture 14 improve.

[0040]in order to check the effect of the mineral water generating device concerning this embodiment, the following experiments were conducted using that by which the conductive substance 14b is not mixed with the mixture 14 of the mineral effluent 14a and the conductive substance 14b. Here,

granular active carbon was used as the conductive substance 14b, using the Coral Sea sand as the mineral effluent 14a.

[0041](Experiment 1) When the conductive substance 14b was made into 30 % of the weight to the mineral effluent 14a, as compared with that with which the conductive substance 14b is not mixed, force current improved to 150% and the mineral elution volume became twice.

[0042](Experiment 2) When the conductive substance 14b was made into 50 % of the weight to the mineral effluent 14a, as compared with that with which the conductive substance 14b is not mixed, force current improved to 165% and the mineral elution volume became 2.5 times.

[0043]When weight % of the conductive substance 14b increased from the above experiments 1 and 2 and weight % of the mineral effluent 14a decreased, in order that the elution volume from the mineral effluent 14a might have increased and mixing of the conductive substance 14b might raise mineral elution efficiency, the dramatically useful thing was checked.

[0044]In this embodiment, since a mineral ingredient is eluted so much from the mixture 14 by the side of the anode, become that toward which mineral elution inclined, but. For example, after changing the polarity of each electrodes 15a and 15b for mineral elution by turns or continuing mineral elution of one mixture 14, if polarity is changed suitably and mineral elution of the mixture 14 of another side is performed, a mineral ingredient can be uniformly eluted from each mixture 14.

[0045]Drawing 2 shows a 2nd embodiment of the mineral water generating device concerning this invention. A different place from said 1st embodiment in this 2nd embodiment is at the point which has arranged the available chlorine generating electrode 20 to the cell 11. The mineral water generating device and identical configuration portion which were explained by said 1st embodiment omit the explanation while being shown with identical codes.

[0046]That is, prescribed clearance was set on the outside of the electrode 15b for mineral elution of the negative pole among the electrodes 15a and 15b for mineral elution arranged at the cell 11, and the available chlorine generating electrode 20 is arranged. Arrangement of this available chlorine generating electrode 20 constitutes the mineral and the available chlorine generation unit 21.

[0047]According to this embodiment, when impressing direct current voltage to the electrodes 15a and 15b for mineral elution from the power supply section 17, it is eluted in a mineral ingredient like said 1st embodiment, and mineral water is generated. When impressing the direct current voltage which uses the available chlorine generating electrode 20 as the anode from the power supply section 17 simultaneously with this, It is electrolyzed between the electrode 15b for mineral elution of the negative pole, and the available chlorine generating electrode 20, and the chloride ion ($Cl^-$) contained in tap water reacts as follows by the available chlorine generating electrode 20 side.

[0048]That is, it becomes $2Cl^- \rightarrow Cl_2+2e^-$, and is generated by chlorine ($Cl_2$). When this chlorine ($Cl_2$) dissolves in water ($H_2O$), it reacts to $Cl_2+H_2O \rightarrow HClO+HCl$, and the hypochlorous acid (HClO) which is available chlorine generates it.

[0049]Propagation of the sterilization in the intake pipe 13 and saprophytic bacteria is controlled from the first by addition of this hypochlorous acid that propagation of the sterilization in the cell 11 and saprophytic bacteria is controlled.

[0050]Since there is a possibility of impairing the taste of mineral water when hypochlorous acid is

generated so much, some current and voltage to the available chlorine generating electrode 20 are good to make it low. When performing only sterilization of the cell 11 and the intake pipe 13, to impress direct current voltage only to the electrode 15b for mineral elution and the available chlorine generating electrode 20 of the negative pole, and what is necessary is just made to make available chlorine high.

[0051]In this embodiment, although the anode and the electrode 15b for mineral elution which counters were used as the negative pole, the available chlorine generating electrode 20, It cannot be overemphasized that available chlorine is generated in the electrode 15b for mineral elution at the time 20 of polar conversion, i.e., an available chlorine generating electrode, even if the negative pole and the electrode 15b for mineral elution turn into the anode.

[0052]In the mineral water generating device concerning this embodiment, the electrode 15b for mineral elution of the negative pole is an electrode which generates mineral water, and it has also become an electrode for generating chlorine, and a manufacturing cost becomes it is remarkable and cheap as compared with the case where a chlorine generator is formed separately.

[0053]Drawing 3 shows a 3rd embodiment of the mineral water generating device concerning this invention. A different place from said 2nd embodiment in this 3rd embodiment, ****** constituted from a mineral and the available chlorine generation unit 22 which has only the mixture 14 by the side of the anode between the two mixtures 14 arranged at the mineral and the available chlorine generation unit 21 concerning said 2nd embodiment, and from which the mixture 14 by the side of the negative pole was removed. The mineral water generating device and identical configuration portion which were explained by said 2nd embodiment omit the explanation while being shown with identical codes.

[0054]As said 1st embodiment also explained, since the mixture 14 in which mineral elution is performed so much is a thing by the side of the positive electrode 15a, it has only this mixture 14. The mineral water generating device concerning this embodiment fits the device of small capacity.

[0055]Drawing 4 shows a 4th embodiment of the mineral water generating device concerning this invention. The place where this 4th embodiment differs from said 3rd embodiment is at the point which installed the mineral and the available chlorine generation unit 22 which comprised the mixture 14, the electrodes 15a and 15b for mineral elution, and the available chlorine generating electrode 20 concerning said 3rd embodiment in right and left side by side. The entrance line part 13a of the intake pipe 13 is formed in the bottom wall of the cell 11 every mineral and available chlorine generation unit 22, and it has structure which connects each entrance line part 13a by the common piping part 13b, and overflows. The mineral water generating device and identical configuration portion which were explained by said 3rd embodiment omit the explanation while being shown with identical codes.

[0056]According to the mineral water generating device concerning this 4th embodiment, it is suitable for the large-sized device which generates a lot of mineral water.

[0057]Drawing 5 shows a 5th embodiment of the mineral water generating device concerning this invention. The mineral water generating device and identical configuration portion which were explained by said 1st [ the ] - a 4th embodiment omit the explanation while being shown with identical codes.

[0058]The mineral water generating device concerning this 5th embodiment, While setting an interval

and carrying out the placed opposite of the two electrodes 15a for mineral elution of the anode, Inside each electrode 15a for mineral elution of the anode, the mixture 14 is arranged separately, respectively, and it has the mineral generation unit 23 which arranges the electrode 15b for mineral elution of the common negative pole between each mixture 14. Set prescribed clearance on the outside of the electrode 15a for mineral elution of one anode, and the available chlorine generating electrode 20 (electrode of the negative pole) is arranged like said 2nd [ the ] - a 4th embodiment, The two entrance line parts 13a of the intake pipe 13 are formed in the bottom wall of the cell 11 like said 4th embodiment, and it has structure which connects each entrance line part 13a by the common piping part 13b, and overflows.

[0059]Since according to the mineral water generating device concerning a 5th embodiment the electrode 15b for mineral elution of the negative pole is common when a mineral ingredient is eluted from the two mixtures 14, As compared with said 4th embodiment, there are few an electrodes 15b for mineral elution of the negative pole, it ends, and device structure is easy.

[0060]Drawing 6 shows a 6th embodiment of the mineral water generating device concerning this invention. The mineral water generating device and identical configuration portion which were explained by said 1st [ the ] - a 5th embodiment omit the explanation while being shown with identical codes.

[0061]The mineral water generating device concerning this embodiment has a structure using the electrode 15a for mineral elution by the side of the anode of each mineral generation unit 23 in common while installing the mineral generation unit 23 explained by said 5th embodiment side by side in [ two ] the cell 11. The three entrance line parts 13a of the intake pipe 13 are formed in the bottom wall of the cell 11, and it has structure which connects each entrance line part 13a by the common piping part 13b, and overflows.

[0062]According to the mineral water generating device concerning a 6th embodiment, it is suitable for the large-sized device which generates a lot of mineral water. Since the electrode 15a for mineral elution by the side of the anode of each mineral generation unit 23 is common, device structure is easy.

[0063]Drawing 7 shows a 7th embodiment of the mineral water generating device concerning this invention. The mineral water generating device and identical configuration portion which were explained by said 1st [ the ] - a 6th embodiment omit the explanation while being shown with identical codes.

[0064]The mineral water generating device concerning this embodiment is what mixed the acid-foods additive 14c in the mixture 14 in addition to the mineral effluent 14a and the conductive substance 14b. Any may be sufficient as long as it is a food additive in which acidity, such as calcium citrate, calcium lactate, calcium sulfate, and calcium sulfite, is shown, for example as the acid-foods additive 14c here.

[0065]According to the mineral water generating device concerning a 7th embodiment, although a mineral ingredient is eluted by electrolysis, since the rise of pH in a cell is controlled with the acid-foods additive 14c, the fall of mineral solubility is prevented and mineral water with high mineral concentration is generated. Since the acid used as a hydrogen ion exponent regulator is a food additive, it is harmless to a human body.